#14/ Appeal Brief
4.22.03
C. Moore

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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit:	2882
Atty. Docket:	8266-0197
Applicant:	Riley
Title:	OPTICAL ISOLATION APPARATUS AND METHOD
Serial No.:	09/515,266
Filed:	February 29, 2000
Examiner:	Courtney, T.

Certificate Under 37 C.F.R. 1.8(a)

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On April 10, 2003

Angelina J. Whitlock

Dated: April 10, 2003

APPEAL BRIEF TRANSMITTAL

COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

Dear Sir:

In response to the Notice of Appeal filed January 24, 2003, an Appeal Brief is being filed in connection with the above-identified application. The original and two (2) copies are being submitted herewith. Also submitted is a check in the amount of $320.00 to cover the fee for filing the Appeal Brief.

The Commissioner is hereby authorized to charge any additional filing fees under 37 C.F.R. 1.16 or processing fees under 37 C.F.R. 1.17 which may be required during the prosecution of this application, or credit of any overpayment, to Bose McKinney & Evans LLP's Deposit Account No. 02-3223. A duplicate copy of this sheet is enclosed.

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APPEAL BRIEF

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This Appeal Brief is submitted in triplicate and furtherance of the Notice of Appeal filed January 24, 2003. A Final Rejection was issued October 24, 2002 and the Notice of Appeal was filed on January 24, 2003. Pursuant to 37 C.F.R. § 1.192, an Appendix containing a copy of the claims involved in the appeal is attached. Applicant has also enclosed a check in the amount of $430.00 of which $320.00 is intended to satisfy the 37 C.F.R. § 1.17(c) Appeal Brief filing fee and $110.00 is intended to satisfy the 37 C.F.R. § 1.17(a)(2) One-Month Extension of Time filing fee.

Real Party in Interest

The above-referenced application has been assigned to Hill-Rom Services, Inc., which is a Delaware corporation headquartered in Batesville, Indiana.

Related Appeals and Interferences

There are no related appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims

Claims 1-19, 61-69, 71, and 73 are pending in the above-identified application and are attached hereto as Appendix A.

Claims 1-19, 61-69, 71, and 73 are rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,796,890 to Tsuji et al. ("Tsuji '890") in view of U.S. Patent No. 5,206,894 to Makrinos et al. ("Makrinos")

Accordingly, claims 1-19, 61-69, 71, and 73 are on appeal.

Status of Amendments

An Amendment filed subsequent to the Final Rejection on November 19, 2002 ("the Final Response") was denied entry to this Appeal in the Advisory Action. Applicant believes that the claim amendments presented in the Final Response were proper and should be entered for this Appeal. Applicant respectfully disagrees with Examiner's position in the Advisory Action that rewriting claim 62 in independent form to include the limitations of independent claim 60 and amending the dependency of claims 61 and 67 would require further search. Also, in the Amendment, claims 60 and 72 were cancelled. Claims 61, 62, and 67 were considered and rejected in the Final Rejection and should not require further search. The Final Response merely places the rejected the claims in better form for consideration on appeal as allowed by 37 C.F.R. § 1.116. For the purposes of this Appeal, the claim amendments presented in the Final Response are treated as entered.

Summary of the Invention

The following is a concise explanation of the invention defined in the claims involved in this appeal. However, the citations in the following summary should not be construed as the only locations of support in the application for the claims involved in this appeal. Further, the following should not be construed to limit the claims involved in this appeal or any other patentable feature of the present disclosure.

With regard to independent claim 1, the present invention includes an optical isolation device (10) comprising an optical channel (14) having a first end (24) and a second end (28), a light source (12) adjacent the first end (24) for transmitting light through the optical channel (14), a detector (16) adjacent the second end (28) for producing electrical power when impinged upon by the transmitted light, a signal generator (18) adjacent the second end (28) powered by the electrical power from the detector (16), the signal generator (18) transmitting optical signals (32) through the optical channel (14) in response to input from a remote isolated circuit (30), the input being generated by a user of the remote isolated circuit (30), and a sensor (20) adjacent the first end (24) for producing electrical signals in response to the optical signals (32). (Applicant's specification, page 5, line 6 through page 7, line 8; Fig. 1).

With regard to claim 62 (rewritten in independent form in the Final Response), the present invention includes a method of electrically isolating a remote circuit (30) from a controller (52), the method comprising the steps of transmitting a first light signal, converting the transmitted first light signal to electrical power only, powering the remote circuit (30) with the electrical power, converting an electrical output signal from the remote circuit (30) to a second light signal, transmitting the second light signal, and converting the transmitted second light signal to an electrical input signal for the controller (52) to cause the controller to perform a task corresponding to the remote circuit electrical output signal wherein the first and second light signals are optically coupled over a signal optical channel (14). (Applicant's specification, page 5, line 6 through page 7, line 8; Fig. 1).

With regard to independent claim 71, the present invention includes an optical isolation device (10) for isolating a user of a remote circuit (30) for controlling equipment in a point of care environment from a circuit (36) for powering the equipment, the device comprising an optical channel (14), a light source (12) for transmitting light in a first direction (26) through the channel (14), a detector (16) for producing power in response to the transmitted light, a signal generator (18) powered by the power from the detector (16), the

signal generator (18) transmitting optical signals (32) in a second direction (34) through the channel (14) in response to user-generated input signals from the remote circuit (30), and a sensor (20) for producing electrical signals for controlling the equipment in response to the transmitted optical signals. (Applicant's specification, page 5, line 6 through page 6, line 26; Fig. 1).

With regard to independent claim 73, the present invention includes an optically isolated control system including a remote circuit (30) for providing an input signal, a source circuit (36) including a power source (50), a controller (52), and an actuator (54) controlled by the controller (52), an isolation device (10) for optically isolating the remote circuit (30) from the source circuit (36), the isolation device including an optical channel (14), a light source (12) powered by the power source (50) for transmitting light through the channel (14), a detector (16) for converting the transmitted light to electrical power for powering the remote circuit (30), an optical signal generator (18), powered by the electrical power, for converting the input signal from the remote circuit (30) to an optical signal (32), the optical signal generator (18) transmitting the optical signal (32) through the channel (14), and a sensor (20) for converting the transmitted optical signal (32) to an electrical signal wherein the source circuit controller (52) responds to the electrical signal by causing the actuator (54) to perform a task corresponding to the input signal from the remote circuit (30). (Applicant's specification, page 5, line 6 through page 7, line 8; Fig. 1).

Issue

I. Are claims 1-19, 61-69, 71, and 73 unpatentable over Tsuji '890 in view of Makrinos under 35 USC §103(a)?

Grouping of Claims

Claims 1-19, 61-69, 71, and 73 are believed to be separately patentable. However, for the purposes of this appeal, claims 1-19 (Group I) are grouped together, claims 61-69 (Group II) are grouped together, and claims 71 and 73 are argued individually.

Arguments

I. Claims 1-19, 61-69, 71, and 73 are patentable over Tsuji in view of Makrinos under 35 USC §103(a).

All of the claims on appeal are currently rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsuji '890[1] in view of Makrinos. Regarding independent claims 1, 71, and 73, the Examiner asserts that Tsuji '890 discloses everything recited in the claims except "an input being generated by a user of a remote isolated circuit," which is disclosed in Makrinos in the form of a hand-held remote control 12. According to the Examiner,

> "[i]t would have been obvious to modify the apparatus of Tsuji et al. wherein a user of the remote isolated circuit generates the input. One would have been motivated to make such a modification so that the apparatus could be instructed to perform a task from a distance, thereby minimizing operator / device contact as taught by Makrinos et al. (column 3, lines 42-46)."

In his response to Applicant's arguments, the Examiner further stated that Makrinos

> "provides a motivation for modifying [Tsuji] such that the [Tsuji apparatus] is configured to perform a task based on the receipt of signals from a user of an isolated circuit. Makrinos et al. teach that a device configured to receive signals from a remote user minimizes device / operator contact, which often leads to increased safety in operation and operability of the device from remote locations. In addition, Tsuji et al. teach the ability of the controller to send signals of one bandwidth and to receive signals of another or second bandwidth thereby minimizing cross-talk of signals."

Amended claim 1 is reproduced below with parenthetical references to items disclosed in Tsuji '035 identified by the Examiner as corresponding to claim limitations:

1. An optical isolation device comprising:

an optical channel **(fiber 41)** having a first end **(near connector 51a)** and a second end **(near connector 51b)**;

a light source **(light source 131)** adjacent the first end for transmitting light through the optical channel;

[1] It should be pointed out that the previous rejection of these claims was based on the parent of Tsuji (i.e., U.S. Patent No. 5,664,035; hereinafter, "Tsuji '035"), and that the Examiner's citations to components corresponding to claim elements corresponds in certain cases to reference designations included in Tsuji '035, not Tsuji '890. For purposes of this Appeal, Applicant treats the Tsuji patents as a single disclosure. Unless otherwise indicated, all citations are to Tsuji '890.

a detector **(array 223)** adjacent the second end for producing electrical power when impinged upon by the transmitted light;

a signal generator **(light source 222)** adjacent the second end powered by the electrical power from the detector, the signal generator transmitting optical signals through the optical channel in response to input from a remote isolated circuit, the input being generated by a user of the remote isolated circuit; and

a sensor **(light receiver 132)** adjacent the first end for producing electrical signals in response to the optical signals.

Accordingly, the Examiner has identified light source 222 of Tsuji '035 as the claimed signal generator. Applicant acknowledges that light source 222 transmits optical signals through fiber 41. Of course, in order for the rejection to be proper, the optical signals must be transmitted "in response to input from a remote isolated circuit, the input being generated by a user of the remote isolated circuit." For this limitation, the Examiner asserts it would have been obvious to combine the remote control 12 of Makrinos. Applicant respectfully disagrees.

When combining the content of various references, "there must be some teaching, suggestion or motivation in the prior art to make the specific combination that was made by the examiner." In re Dance, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); In re Raynes, 28 USPQ2d 1630, 1631 (Fed. Cir. 1993); In re Oetiker, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Gordon, 221 USPQ 1125, 1127 (Fed. Cir. 1984). "Obviousness cannot be established by hindsight combination to produce the claimed invention." In re Dance, 48 USPQ2d at 1637; In re Gorman, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). "Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. There must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in the way they were combined by the inventor." ATD Corp. v. Lydall Inc., 48 USPQ2d 1321, 1329 (Fed. Cir. 1998).

Finally, "both the suggestion and the reasonable expectation of success must be founded in the prior art, and not in the applicant's disclosure." In re Vaeck, 20 USPQ2d at 1442. "[I]t is the prior art itself, and not the applicant's achievement, that must establish the obviousness of the combination." In re Dance, 48 USPQ2d at 1637; Interconnect Planning Corp. v. Feil, 227 USPQ 543, 551 (Fed. Cir. 1985).

"Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." In re Dembiczak, 50 USPQ2d at 1617; Feil, 227 USPQ at 547 (Fed. Cir. 1985). The prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983); M.P.E.P. § 2141.02.

As Applicant pointed out in a telephonic interview with the Examiner, light source 222 responds to inputs from control circuit 21, which receives its inputs from sensors disposed in the adverse, potentially explosive environment of field station 20. (see Tsuji, col. 1, ll. 55-59) (stating, "Field stations 20, 30 are assumed to be placed in adverse environments, such as, for example, in dangerous areas in an oil refinery or chemical factory, in which a potentially explosive atmosphere exists"). In general, Tsuji explains that "[c]ontrol station 10 controls two field stations 20, 30, [each of which] typically contains transducers and works as a sensor which measures temperature, pressure, etc. or works as an actuator which adjusts temperature, pressure, etc." (Tsuji, col. 1, ll. 22-30).

Tsuji further states that

> "[c]ontrol circuit 21 is an interface with any type of transducer (not shown) or sensor (not shown) that are in field station 20. Control circuit 21 detects control data in the electric signal [derived from the optical signal from control station 10]. Control circuit 21 controls a light source 22 [light source 222 of Tsuji '035] for producing an outgoing beam which passes through [to control station 10]."

(Tsuji, col. 8, ll. 42-59).

Thus, light source 222 of field station 20 produces optical signals in response to electrical signals from control circuit 21, which functions as an interface with sensors disposed in the adverse environment of field station 20. That is the essence of the teaching of Tsuji. Through

the optical isolation of fiber 41, control station 10 sends signals to field station 20 to control actuators in the adverse environment, and field station 20 provides feedback to control station 10 based on signals from sensors in the adverse environment.

Accordingly, the Examiner's combination of Makrinos with Tsuji requires either (1) incorporating the remote control 12 of Makrinos at the field station end of the Tsuji system such that light source 222 directly responds to inputs from the remote control 12, or (2) incorporating the remote control 12 at the control station end such that light source 222 indirectly responds to inputs from the remote control 12 (i.e., after those inputs are converted to light, transmitted via fiber 41, converted back to electricity, and used to affect the measurements of the sensors of field station 20 which provide inputs to light source 222 via control circuit 21). Neither combination is proper.

The first option requires either replacing the field station sensors and control circuit 12 with remote control 12, or incorporating remote control 12 as an auxiliary input to light source 22. Tsuji teaches away from both configurations. Given the adverse environment in which field station 20 resides, it is nonsensical to suggest that the sensors and control circuit 21 of field station 20 could be replaced with a user operating a remote control device. The purpose of the Tsuji system is to avoid human exposure to this adverse environment. Thus, this version of the combination is proper only if some teaching or suggestion exists in the cited references for incorporating a remote control 12 as an auxiliary input to light source 222 of field station 20.

Makrinos teaches use of remote control 12 to activate an X-ray exposure mechanism of a mobile X-ray unit from a distance to minimize radiation exposure to the technologist operating the mobile unit. Nothing in Makrinos even hints at using remote control 12 for any other purpose, let alone as an auxiliary input device for a light source of a first apparatus that is optically isolated from a second apparatus.

Similarly, nothing in Tsuji provides any motivation for adding a user-operated remote control to provide auxiliary input signals to light source 222. The only disclosure in Tsuji of input signals for light source 222 are those provided by control circuit 21. Those input signals originate from the temperature and pressure sensors coupled to control circuit 21. Tsuji does not state that other inputs could be routed or provided to light source 222 either instead of, or in addition to those from control circuit 21.

Indeed, Applicant is unable to even imagine how an additional input could be used in the Tsuji system. Tsuji teaches a closed-loop system, wherein the control station operates (and provides power to) actuators in the field stations (via an optical channel), and receives feedback from sensors in the field stations that measure parameters of the adverse environment. Even assuming a user-operated remote control could send input signals to light source 222, what commands or information would the user send in such a system?

The only other alternative configuration of the Examiner's proposed combination is the incorporation of the remote control 12 at the control station to provide inputs to the control station, which, through a sequence of events, are ultimately responded to by light source 222. Again, however, nothing in either reference teaches or suggests such a combination. The only inputs received by control station 10 of the Tsuji system are the feedback signals from field stations 20, 30. This follows from the closed-loop nature of the system. For example, Tsuji explains that:

> "control station 10 periodically (period: T) sends a control signal to field stations 20, 30 to renew their measurement data. Field stations 20, 30 send new data to control station 10 after a response time t elapses from when field stations 20, 30 receive the control signal from control station 10."

(Tsuji, col. 11, ll. 17-22).

Tsuji continues:

> "According to the present invention, control station 10 monitors the response time of field stations 20, 30 and stops feeding power light when the response time exceeds a predetermined time. Thus, power consumption in control station 10 is reduced."

(Tsuji, col. 11, ll. 49-53).

Given the Tsuji system, there is no reason to provide a user-generated input to control station 10. Certainly, nothing in Tsuji suggests a motivation for incorporating such a feature.

Moreover, incorporating remote control 12 at the control station end of Tsuji is contrary to the Examiner's purported "motivation" for combining these two references. According to the Examiner, one would have been motivated to make the combination because remote control 12 would permit operation of the system "from a distance, thereby minimizing operator / device contact as taught by Makrinos et al. (column 3, lines 42-46)." In other words, one would be inclined to use a remote control to stay clear of potential danger

(e.g., radiation). There is no danger, however, at the control station end of the Tsuji system. Thus, even setting aside the fact that the closed-loop nature of the Tsuji system teaches away from an auxiliary input, there is absolutely no motivation to operate control station 10 from a distance. Control station 10 is in a safe environment. If there were a reason to receive user-generated inputs at control station 10 (which there is not), a keyboard or other non-remote input device could be directly connected to control station 10. Indeed, control station 10 itself remotely controls field stations 20, 30. No motivation exists for remotely controlling (with remote control 12) the remote controller (control station 10).

Thus, Applicant respectfully submits that the Examiner has failed to establish a *prima facie* case of obviousness. The Examiner has merely identified a reference that shows a user-operated remote control and declared that feature properly combinable with Tsuji. Without some teaching, suggestion or motivation to modify Tsuji to incorporate that feature, however, such a combination is an impermissible application of hindsight. As outlined above, no basis for the combination exists in either reference. Thus, Applicant respectfully submits that the rejection of independent claim 1 (and claims 2-19 depending from claim 1) should be reversed.

The Examiner also asserts that Tsuji discloses all of the limitations of dependent claims 2, 4, 8, and 9. Specifically regarding dependent claim 9, Applicant cannot find any disclosure (and the Examiner has not cited any) in Tsuji of a controller that induces a "light source to generate light in pulses having an on time and an off time and [induces a] signal generator to generate optical signals during the off time of the light." For this additional reason, Applicant submits that claim 9 is allowable over the cited art.

Regarding dependent claim 3, the Examiner acknowledges that Tsuji does not disclose a controller (coupled to a light source and a sensor) that causes a task to be performed in response to receipt of optical signals. However, the Examiner asserts that Makrinos discloses "an apparatus configured to perform a task in response to optical signals" that would have been obvious to combine with the disclosure of Tsuji. According to the Examiner, "[o]ne would have been motivated to make such a modification so that the controller could perform a task, initiated from non contact signaling, thereby minimizing operator / device interaction as taught by Makrinos et al. (column 3, lines 42-46)." As set forth above, Makrinos is not properly combinable with Tsuji. Accordingly, the rejection of claim 3 should also be reversed.

Regarding dependent claims 10-19 (and dependent claims 61-69), the Examiner acknowledges that Tsuji fails to disclose the recited limitations, but cites a pro forma disclaimer paragraph of the Tsuji specification as support for the proposition that Tsuji "anticipate[s] variations, modifications and/or alternate embodiments that do not deviate in scope (or spirit) from the disclosed invention (see column 7, lines 12-18)." The Examiner further states:

> "it would have been obvious to . . . devise a system further incorporating various light sources (i.e. monochromatic, laser, LED, pulsed, continuous, wavelength specific, frequency dependent, etc.), configured to supply enough power to receiving elements (see title of Tsuji et al., abstract and summary), since these elements and techniques are well within the skill level of a practitioner in the art."

Claim 10, for example, recites "an electrical storage device electrically coupled to the detector" that is adjacent the second end of the optical channel. The second end, according to the Examiner, corresponds to the field station end of the Tsuji system. Tsuji, however, teaches eliminating an electrical storage device at field station 20. Tsuji clearly states that it is an object of the invention "to provide an optically powered bidirectional signal transmission apparatus between a control station and a field station which eliminates a battery from the field station and reduces maintenance costs." (Tsuji, col. 2, ll. 37-42). Tsuji further states that "[i]n the present invention, battery 25 (as shown in Prior Art FIG. 11) is eliminated from the bidirectional optical transmission system by optically powering field station 20 with light supplied from control station 10." (Tsuji, col. 11, ll. 34-37). Clearly, modifying Tsuji to include "an electrical storage device coupled to the detector" deviates from both the scope and spirit of the invention disclosed in Tsuji.

Independent claim 60 was rejected for the same reasons as claim 1. Applicant has canceled claim 60 and re-formatted dependent claim 62 to include the limitations of claim 60 explicitly, rather than by incorporation. The dependencies of claims 61 and 67 have been changed to depend from claim 62. As indicated above, claim 62 was rejected as part of the Examiner's blanket rejection of the dependent claims 61-69. Again, this rejection is improper. Among other things, claim 62 recites "transmitting a first light signal," "converting the transmitted first light signal to electrical power only," and "powering the remote circuit with the electrical power." Claim 62 further recites, "the first and second light

signals are optically coupled over a single optical channel." Nothing in Tsuji teaches first and second light signals coupled over a single channel wherein the first light signal is converted to power only for powering a remote circuit. For this additional reason, the rejection of claim 62 (and dependent claims 61 and 63-69) is improper.

Regarding dependent claims 61 and 63-69, the Examiner acknowledges that Tsuji fails to disclose the recited limitations, but cites a pro forma disclaimer paragraph of the Tsuji specification as support for the proposition that Tsuji "anticipate[s] variations, modifications and/or alternate embodiments that do not deviate in scope (or spirit) from the disclosed invention (see column 7, lines 12-18)." The Examiner further states:

> "it would have been obvious to . . . devise a system further incorporating various light sources (i.e. monochromatic, laser, LED, pulsed, continuous, wavelength specific, frequency dependent, etc.), configured to supply enough power to receiving elements (see title of Tsuji et al., abstract and summary), since these elements and techniques are well within the skill level of a practitioner in the art."

The Examiner cannot properly reject all of the limitations of these dependent claims by merely referring to a perfunctory statement in Tsuji that modifications may be made to the disclosed embodiments.

Independent claim 71 is directed to "[a]n optical isolation device for isolating a user of a remote circuit for controlling equipment in a point of care environment from a circuit for powering the equipment." Like claim 1, claim 71 includes a signal generator that transmits optical signals through the optical channel "in response to user-generated input signals from the remote circuit." Thus, for the reasons discussed above with reference to claim 1, the rejection of claim 71 is improper.

Additionally, claim 71 recites "a sensor for producing electrical signals for controlling the equipment in response to the transmitted optical signals." Thus, claim 71 recites "an isolation device," "a remote circuit," "equipment in a point of care environment," and "a circuit for powering the equipment." The "isolation device" includes a sensor that produces signals "for controlling the equipment." The Examiner has identified sensor 132 as the claimed sensor. The Examiner has not, however, identified the "equipment in a point of care environment" that is controlled by the signals produced by the sensor. For this additional

reason, the rejection of claim 71 is improper.

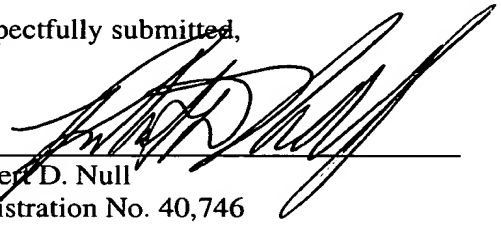
Finally, independent claim 73 stands rejected based on the combination of Tsuji and Makrinos. Thus, Applicant submits that the rejection is improper for the reasons outlined above with reference to claim 1. Additionally, claim 73 recites "a source circuit including a power source, a controller, and an actuator controlled by the controller." The Examiner has not specifically identified any of these components of the claimed source circuit. The only power source in the Tsuji system is control station 10. Accordingly, control station 10 must be included in the "source circuit." The only conceivable "controller" is control circuit 11 of control station 10. If this is the interpretation the Examiner had in mind when formulating the rejection, then it completely ignores the limitation that "an actuator controlled by the controller" is also included in the source circuit. Tsuji contains no disclosure of any "actuator" that is part of anything that could reasonably be considered a "source circuit." Thus, for this additional reason, the rejection of independent claim 74 is improper.

Conclusion

In view of the above, it is clear that the Examiner's rejections are without merit. Applicant therefore requests that the present rejections be reversed and a Notice of Allowance be issued in due course.

If necessary, Applicants request that this Appeal Brief be considered a request for an extension of time for a time appropriate for the response to be timely filed. Applicants request that any required fees needed beyond those submitted with this Appeal Brief be charged to the account of Bose McKinney & Evans, Deposit Account Number 02-3223.

Respectfully submitted,



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APPLICATION SERIAL NO. 09/639,415

APPEAL BRIEF

APPENDIX

CLAIMS AT ISSUE

1. (Amended) An optical isolation device comprising:

an optical channel having a first end and a second end;

a light source adjacent the first end for transmitting light through the optical channel;

a detector adjacent the second end for producing electrical power when impinged upon by the transmitted light;

a signal generator adjacent the second end powered by the electrical power from the detector, the signal generator transmitting optical signals through the optical channel in response to input from a remote isolated circuit, the input being generated by a user of the remote isolated circuit; and

a sensor adjacent the first end for producing electrical signals in response to the optical signals.

2. (Amended) The device of claim 1 wherein the optical channel includes a fiber optic filament.

3. (Amended) The device of claim 1 further comprising a controller coupled to the light source and the sensor, the controller causing a task to be performed in response to receipt of the optical signals.

4. (Amended) The device of claim 1 further comprising a lens adjacent the second end of the optical channel, the lens refracting both the optical signals and the light.

5. (Amended) The device of claim 1 wherein the detector is an opto-electrical detector having a photovoltaic cell.

6. (Amended) The device of claim 1 wherein the detector includes an array of photonic devices.

7. (Amended) The device of claim 6 wherein the photonic devices are photovoltaic cells.

8. (Amended) The device of claim 7 further comprising a lens adjacent the second end of the optical channel, the lens refracting both the optical signals and the transmitted light.

9. (Amended) The device of claim 3 wherein the controller is further coupled to the signal generator, the controller inducing the light source to generate light in pulses having an on time and an off time and inducing the signal generator to generate optical signals during the off time of the light.

10. (Amended) The device of claim 9 further comprising an electrical storage device electrically coupled to the detector.

11. (Amended) The device of claim 1 wherein the intensity of the light source and the sensitivity of the detector are sufficient to satisfy the power needs of the remote isolated circuit and the signal generator.

12. (Amended) The device of claim 1 wherein the light source generates light in a bandwidth centered about a first frequency, the detector is sensitive in a bandwidth including the first frequency, the signal generator generating optical signals in a bandwidth centered about a second frequency, and the sensor being sensitive in a band width including the second frequency.

13. (Amended) The device of claim 12 wherein the light source generates monochromatic light.

14. (Amended) The device of claim 13 wherein the sensor is not sensitive to the monochromatic light.

15. (Amended) The device of claim 12 wherein the sensor is not sensitive to light in the bandwidth centered about the first frequency.

16. (Amended) The device of claim 12 wherein the light source is a laser.

17. (Amended) The device of claim 16 wherein the laser is a semiconductor laser.

18. (Amended) The device of claim 16 wherein the signal generator includes a light emitting diode.

19. (Amended) The device of claim 12 wherein the light source has a narrow bandwidth.

61. (Twice Amended) The method of claim 62, wherein power is generated by the first light signal impinging a photovoltaic cell.

62. (Amended) A method of electrically isolating a remote circuit from a controller, the method comprising the steps of:

transmitting a first light signal;

converting the transmitted first light signal to electrical power only;

powering the remote circuit with the electrical power;

converting an electrical output signal from the remote circuit to a second light signal;

transmitting the second light signal; and

converting the transmitted second light signal to an electrical input signal for the controller to cause the controller to perform a task corresponding to the remote circuit electrical output signal;

wherein the first and second light signals are optically coupled over a signal optical channel.

63. (Original) The method of claim 62, further comprising the step of communicating the first light signal and the second light signal in a half-duplex mode.

64. (Amended) The method of claim 63, wherein the step of communicating the first and second light signals in half-duplex mode comprises the steps of:

communicating the first light signal according to a duty cycle having an on state and an off state; and

communicating the second light signal during the off state of the duty cycle.

65. (Original) The method of claim 62, further comprising the step of communicating the first light signal and second light signal in full-duplex mode.

66. (Amended) The method of claim 65, wherein the step of communicating the first and second light signals in full-duplex mode comprises the steps of:

selecting a first frequency for the first light source;

selecting a second frequency for the second light source, the second frequency being different from the first frequency;

providing a photovoltaic cell responsive to the first frequency; and

providing an opto-electrical sensor responsive to the second frequency.

67. (Twice Amended) The method of claim 62, wherein the first light signal is transmitted over a first optical channel and the second light signal is transmitted over a second optical channel.

68. (Amended) The method of claim 67, wherein the first and second light signals are transmitted in a full-duplex mode.

69. (Amended) The method of claim 68, further comprising the step of optically shielding the first and second optical channels to inhibit optical communication between the first and second optical channels.

71. (New) An optical isolation device for isolating a user of a remote circuit for controlling equipment in a point of care environment from a circuit for powering the equipment, the device comprising:

an optical channel;

a light source for transmitting light in a first direction through the channel;

a detector for producing power in response to the transmitted light;

a signal generator powered by the power from the detector, the signal generator transmitting optical signals in a second direction through the channel in response to user-generated input signals from the remote circuit; and

a sensor for producing electrical signals for controlling the equipment in response to the transmitted optical signals.

73. (New) An optically isolated control system, including:

a remote circuit for providing an input signal;

source circuit including a power source, a controller, and an actuator controlled by the controller;

an isolation device for optically isolating the remote circuit from the source circuit, the isolation device including

an optical channel,

a light source powered by the power source for transmitting light through the channel,

a detector for converting the transmitted light to electrical power for powering the remote circuit,

an optical signal generator, powered by the electrical power, for converting the input signal from the remote circuit to an optical signal, the optical signal generator transmitting the optical signal through the channel, and

a sensor for converting the transmitted optical signal to an electrical signal;

wherein the source circuit controller responds to the electrical signal by causing the actuator to perform a task corresponding to the input signal from the remote circuit.